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A practical treatise on sea-bathing and

A
PRACTICAL TREATISE

ON

SEA-BATHING

AND

SEA-AIR.

BY

GEORGE HARTWIG, M.D.

SECOND EDITION.

LONDON:

JOHN CHURCHILL, NEW BURLINGTON STREET.

1861.

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du bleu foncé au vert au
au jaune pâle, mais d'autres
causes peuvent lui donner
imprimer des colorations
spéciales, permanentes ou
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Accumulation de végétaux
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A
PRACTICAL TREATISE
ON
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PREFACE.

The Author of this little Work having practised during the last nine years in Ostend, which is annually visited by so many thousands for the purpose of sea-bathing, has had numerous opportunities of observing the wonderful effects of this excellent, and in many cases unequalled, remedy. At the same time, he frequently has had occasion to deplore that so many patients, from ignorance of its proper use, and for want of following an adequate regimen, derive no great advantage from their sojourn on the coast, but even aggravate the evils for which they sought relief—converting by their own fault a fountain of physical regeneration into waters of bitterness and reproach.

Others again, having no idea of the important changes which sea-bathing brings

about in the economy, incautiously trust themselves to the briny flood, although its effects are completely at variance with their constitution or the diseases under which they labour ; and thus run the risk of ruining their health or hastening their dissolution. Even among those whom nothing ails, there are many who injure themselves by imprudent bathing.

A wide experience having thus taught the Author how frequently this powerful remedy is ill-used and misapplied, he hopes that the utility of a popular and practical Treatise on Sea-Bathing will be appreciated by the public, and feels confident that, although many faults of style and composition may justly be laid to his charge, he has at least not failed in the most essential point ; and that no bather, who follows his directions, will regret having done so.

Ostend, 1854

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CHAPTER I.

THE MODE OF ACTION AND THE EFFECTS OF SEA-BATHING UPON THE HUMAN FRAME.

SEA-BATHING on the British coast—for its action is different in the tepid waters of a warmer climate—owes its efficacy to the combined influences of cold, of the saline particles which enter into the composition of sea-water, and of the shock produced by the impulsion of the waves. In order fully to understand its effects, we must endeavour to form a just estimate of the power of each one of these agents individually.

The first impression produced on the body of the bather by the cool temperature of the sea, which rarely even in the heat of summer exceeds 67 degrees, consists in a more or less unpleasant sensation of cold and shivering; the respiration is spasmodically accelerated; the skin contracts; the blood is driven to the

inner parts; the pulse becomes small and frequent. These primary symptoms of depression are owing to the hostile effect of cold, which tends to diminish vital action by withdrawing from the body the warmth which is necessary for existence. But the living body possesses the faculty of reacting against all sudden changes which disturb the harmonious play of its functions. The depression momentarily caused by the contact of the cold is therefore soon succeeded by symptoms of an opposite character. The blood which had accumulated in the inner organs, returns to the surface with accelerated flow; the unpleasant sensation of cold is followed by an agreeable feeling of warmth; the contracted pulse beats vigorously; the oppression on the breast, the spasmodic respiration, the palpitation of the heart,—all disappear.

If the bather leaves the water while this salutary reaction is in its full vigour, an increased vital action will continue for some time afterwards, and plainly show itself by a heightened feeling of strength, and a more genial flow of spirits. But if he continues

to remain in the water so long as to allow the cold once more to gain the mastery, then the primary symptoms of depression will reappear ; but this time, as can easily be imagined, with a greater intensity, so that a feeling of cold, weakness, and indisposition often prevails for hours after a bath thus injudiciously protracted.

The invigorating influence of cold shows itself in the common river-bath as well as in the sea ; but here it is greatly assisted by the saline composition of the water, and the shock of the waves. Of the stimulating power of the latter, he only can have an adequate idea who has himself felt the difference between bathing in a calm or in an agitated sea. The mighty impulse, dashing against the body, rouses with electrical rapidity all the energies of the frame, and promotes in an astonishing degree the rapidity and strength of the reaction, which follows upon the first impression of the cold. Every time that a strong wave touches the bather, it seems to infuse new vigour into his veins, and not unfrequently raises his spirits to boyish exclama-

tions of delight. No wonder he complains when Ocean is at rest.

The salts, finally, which are contained in sea-water in a proportion of about three and a half per cent., produce a stimulating effect upon the skin, and determine a more copious flow of blood to that organ: assisting the reaction provoked by the cold, and at the same time shortening and diminishing its primary depressing effect. It is owing to their presence that one can agreeably bathe in the sea at a much lower temperature than in sweet water. Reaction, even in vigorous natures, is generally slow in making its appearance in a river; in the sea, even where its surface is unruffled with a wave, it is almost instantaneous. The agreeable glow, the light burning of the skin, which lasts for hours after bathing in the sea, and is never felt either so intensely or so long after immersion in sweet water, also proves how greatly its saline qualities contribute to its effects.

Having thus briefly described the agencies to whose combined influence the sea-bath

owes its efficacy, we will now point out the changes which it operates in the human frame.

It is evident that its first effect is powerfully to stimulate the numerous sensitive nerves of the skin, which instantaneously convey the profound impression they have received to the spinal-marrow and the brain, and these central organs, in their turn, carry it onwards through all the ramifications of the nervous system. All our organs being under the supreme direction of the nerves, every part of the body must, therefore, be excited and stimulated by the sea-bath; as when a bell is struck, the vibration extends over every particle of the metal. Hence we see how erroneous it would be to derive all the benefits of sea-bathing from its local action on the skin, since its immediate effect is nothing less than a general stimulation of the whole nervous system, or rather of all the organs which constitute the human body. But every stimulation of an organ which is not immoderate, causes an increased flow of blood to the part, favours its nutrition, and

finally increases its strength, as we plainly see by the invigorating effects of practice and exercise. When, therefore, the whole body, or some particular organ has been weakened, so that the blood no longer circulates with sufficient activity in the enfeebled frame, which being badly nourished, is rendered incapable of vigorous exertion : the sea-bath necessarily tends to remove this debility, by stimulating nutrition in every organ, and consequently improving its functions.

While the solid parts are thus modified the composition of the blood undergoes a no less important change ; for the secreting organs partaking necessarily of the general stimulation, the cutaneous transpiration augments ; the urine becomes more saturated ; the liver pours out a greater quantity of bile ; and a more active respiration consumes a greater quantity of carbon ; in this manner the blood gradually purifies itself of a mass of worn-out particles, which the body tolerated as long as it was in a languid state, but which, awakened to greater energy, it casts off as an intolerable load. At the same time the

more active vegetation, which prevails in all parts of the body, necessarily increases the want of food; the appetite improves; digestion becomes more vigorous; and thus the blood grows gradually richer in plastic and nutritious parts—in fibrine, albumen, and globules, until at length it completely harmonizes with the wants of a more vigorous vital process.

Next to the strengthening effects of the sea-bath, its alterative action must not be overlooked, for it is the necessary consequence of a more energetic vegetation gradually to remove every vitiated or useless particle from the composition of the body.

By merely considering it as an excellent, and in many cases unequalled, tonic, we should not yet form an adequate idea of its extensive powers, for it may be deservedly employed as a resolvent, alterative, and depurative remedy in all cases where evil consequences are not to be apprehended from an increase of stimulation.

CHAPTER II.

THE DISEASES AGAINST WHICH SEA-BATHING IS PARTICULARLY EFFICACIOUS: SCROFULA, RICKETS, NERVOUS DEBILITY, NERVOUS COMPLAINTS, DYSPEPSIA, WEAKNESS OF THE SKIN, TORPIDITY AND PARALYSIS, PASSIVE HEMORRHAGIES, LOCAL WEAKNESSES.

DEBILITY, which is the fundamental character of all the diseases for which sea-bathing is found to be one of the best remedies, shows an immense variety of symptoms, according to the different parts which it affects, and to the age, sex, constitution, and temperament of the sufferers. In children it frequently appears under the form of scrofula, which is either an hereditary complaint, or the result of a faulty physical education. Scrofulous children are distinguished by a peculiar habit of body, which plainly shows the origin of all their evils to be weakness.

They are either irritable subjects with a delicate thin skin, which allows the blood-vessels to be seen under it, and thus gives rise to a delusive appearance of health; or of a phlegmatic nature, with pale, bloated faces, a thick upper lip, a swollen nose, and an enlarged abdomen. Their blood is watery, containing less fibrine than healthy blood, and consequently affording an imperfect nutrition; their membranes are relaxed; their muscles are soft and without energy. Their circulation being feeble and languid, they are deficient in animal warmth, and but little able to bear the vicissitudes of a cold and moist climate. This peculiarly unfavourable state of body, where weakness of the solid parts is united with a faulty composition of the blood, disposes them to a variety of obstinate and dangerous local diseases, such as chronic inflammations of the joints, glands, and mucous membranes, ulcers, and eruptions, cold abscesses, curvature of the spine, and caries of the bones.

The principles on which the treatment of scrofula reposes are, 1st., to make better blood;

2nd., to strengthen the solids; 3rd., to give vigorous action to the circulation; and for all these purposes there surely exists no better remedy than sea-bathing; for it not only improves the vegetation of the solids, but at the same time effects a salutary change in the composition of the blood, and gives vigour to the circulation, thus attacking the disease on all sides, and fulfilling all indications at once.

A similar constitution to that we have just described, gives rise to the rickets, which by some authors, are considered as a variety of scrofula. The softening, and consequent inability of the bones to bear the weight of the body, and to withstand muscular action, eventually causes the most dreadful deformities, which, when once fully developed, can frequently be no longer remedied, but as long as the disease is still in its first stage, sea-bathing is able to cure it radically, and entirely to obviate its disastrous consequences.

That sea-bathing, which so powerfully rouses the energies of the nervous system, and secures its vigour on the solid basis of

an improved nutrition, should prove itself to be a most excellent remedy against almost every form of nervous disease, from simple debility or irritable weakness, to epilepsy and inveterate hysteria, cannot be a matter of surprise.

Irritable weakness of the nerves, a very common complaint in our days, displays a great variety of symptoms, differently grouped in each individual case, according to the nervous provinces which are more particularly affected. The intelligence is frequently quick and lively, but incapable of fixing its attention for any length of time on one subject; energy is found wanting in all its functions. The spirits are very unequal, but generally more inclined to melancholy. The patient loves solitude, sighs and weeps without any cause, and wishes for death, though fortune smiles upon him. Slight vexations make a deeper impression upon his mind than is consonant with his age or sex, and while a trifle casts him down, a trifle again renders him as immoderately joyful. He is easily led away by the whim of the moment, and allows him-

self to be despotically governed by his caprices. He is subject to a variety of disagreeable moral and physical sensations, which are unknown to stronger nerves. His slumbers are light and uneasy. Changes of temperature affect him very much. His pulse is small and frequent; his movements are quick, but without energy; and a few rapid steps soon take away his breath. The blood is unequally distributed; while the head glows, the feet are cold. He cannot support hunger without soon feeling completely exhausted; and stimulating food heats him very much. His appetite is weak and speedily loses itself if the accustomed time for meals is suffered to go by. Impressions of all kinds extend more easily from one nervous province to another; the mind is affected by slight bodily changes; and trifling emotions quickly disturb the functions of the body.

This irritable state of the nerves, which although it may not yet have assumed any definite form of disease, frequently suffices to embitter or lessen the enjoyment of life, finds a most decided antagonist in sea-bathing,

which by increasing the tone of the nervous system, at once removes a host of disagreeable sensations or little weaknesses. It is true, that where nervous irritability is constitutional or hereditary, nothing will radically cure it, but at any rate sea-bathing will be found more efficacious than any other remedy to alleviate many of its symptoms, and prevent its gaining ground or assuming a worse character.

Every sensitive nerve is liable to neuralgic pains ; but in no part of the human body are they of more frequent occurrence than in the skin, owing to the vast number of sensitive fibres possessed by this organ, and to its being exposed to so many causes of disturbance. Sometimes they depend upon affections of distant organs requiring a different treatment, but generally they are only an exaggeration of irritable weakness in a particular nerve, and in these cases, sea-bathing is undoubtedly one of the most appropriate remedies. Tic-douloureux, ischias nervosa, cramps in the stomach, nervous colics, painful menstruation, and nervous headaches, diseases well known

for their obstinacy, have frequently been cured by its use.

Excessive irritable weakness of the motive nerves does not reveal itself by pain, but by increased and disordinate motions, by spasms. Thus in St. Vitus' dance, the arms legs and muscles of the face, are in a perpetual agitation, and the will has lost all control over them. Children of a weak and irritable constitution, between nine and fifteen, are most liable to this complaint, for which no remedy is found to answer better than repeated immersions in cold water, and particularly in the sea.

Dyspepsia, as it is one of the commonest forms of debility, is also one of the most troublesome. The relaxation of the muscular fibres of the stomach, and an altered condition of the gastric juice, which may proceed as well from irritable weakness of the ganglionic nerves, as from a faulty composition of the blood, are its most frequent causes. But sea-bathing, as we have shown, effectually opposes both muscular debility and humoral impoverishment, and thus it

frequently effects radical cures of dyspepsia where all internal remedies had only afforded palliative relief, or proved totally ineffectual.

It often happens after a serious illness that a prolonged general or local debility remains behind. Thus after a nervous fever, we see weakness of the memory, deafness, giddiness, swimming in the head, pains in the limbs, dyspepsia, persist for a length of time. Inflammations of important organs are succeeded by great debility of the part. After serious attacks on the constitution, as after poisonings and cholera, it generally rallies with the greatest difficulty. Rheumatic and arthritical complaints are not unfrequently followed by permanent weakness or lameness of the affected part. After a violent sprain or dislocation, the debilitated limb is unable to perform its functions with the same energy as before the accident took place. In all these cases the patient may expect the greatest benefit from sea-bathing.

A great many disorders arise from weakness of the skin, which, besides being the principal seat of feeling, is also one of the

chief organs of secretion; for a healthy adult loses daily by imperceptible transpiration no less than two pounds weight, which is a greater quantity than is evacuated either by the kidneys, the liver, or the lungs. Transpiration may be either insufficient or too abundant, and in both cases the health must suffer; for, in the first, many effete matters remain in the circulation, and vitiate the blood; and, in the second, the body is weakened by a considerable loss of humours. Want of cleanliness by closing the pores of the skin, and too warm a clothing by relaxing its tissue, are frequent causes of these opposite functional defects. Keeping the skin too warm has the further evil effect of rendering it extremely liable to catch cold, so that the slightest change of temperature suffices to disturb its functions, and to cause by reaction illnesses in inward parts, thus provoking habitual catarrhs, sore throats, croup, bronchitis, rheumatism, erysipelas, diarrhoea, colic, spasms, neuralgic pains, and a variety of other complaints too long to enumerate.

Since, then, an impaired activity of the

skin is so fertile a cause of disorders, it is evident that by strengthening its tissue, we cut off the source of a great many illnesses; and where can we possibly find a better means for this purpose than sea-bathing, which not only acts on the skin, as upon all other organs, through the medium of the nervous system, but stimulates it moreover in a direct and immediate way.

General or partial weakness of the nerves not always shows itself in increased irritability, but also in diminished action, in torpidity. Thus, many persons, owing to an inactivity of the intestinal nerves, suffer from constipation, which causes so many disagreeable symptoms, such as want of appetite, heaviness of the head, giddiness, and lassitude. The use of the sea-bath radically cures this complaint where all other remedies had failed, and thus affords the most convincing proofs that its exciting and stimulating action extends as powerfully over the vegetative functions as over those parts which are under the immediate dominion of the spinal and cerebral nerves. In many cases of paralysis, benefit

may be expected from the sea-bath; for all remedies that suddenly stimulate the skin in a considerable degree, make, by irradiation and reflexion, a powerful impression on the spinal-marrow and the brain, and are able to waken the dormant energies of any part of these central organs.

Sea-bathing is found also to be an excellent remedy where females have been considerably weakened by great and repeated losses of blood, and where, in consequence of general languor and debility, the catamenia are not sufficiently active.

In consequence of hereditary disposition, of a sedentary way of living, of excesses in eating and drinking, or of the abuse of purgative medicines, the blood frequently stagnates in the abdominal organs, and thus gives rise to a great variety of disorders. The digestive process suffers, either in the stomach or lower down in the intestinal tube, according to the seat of the stagnation, and the mixture of the blood soon becomes faulty, as the first important act of its formation is disturbed. Thus most cases of arthritis, hæmorrhoids, and

gravel, originate in abdominal stagnation. And as the nerves which preside over digestion are also in a suffering state, they react on the central organs, and thus give rise to nervous complaints, such as profound hypochondria and melancholy. In many cases of this description, where the evil is as yet only in its first stadium, sea-bathing will be found an excellent remedy, as it promotes a more equal distribution of blood over the whole economy, and strengthens the tone of the relaxed vessels; and where, in more deeply-rooted cases, the use of resolvent, opening and blood-thinning remedies is previously required, it is extremely useful as an after-cure.

CHAPTER III.

THE DISEASES WHICH FORBID THE USE OF SEA-BATHING.

WHEN we consider the important changes which sea-bathing effects in the economy, and how profoundly it stimulates vegetation, there can be no doubt that when employed in the wrong place, its consequences must be as pernicious as they otherwise prove beneficial. It is, in truth, a double-edged sword, wounding the patient where it does not touch the disease. Thousands are indebted to its use for a vigorous health unknown to them before ; many a weak reed has been converted through its agency into a strong tree, capable to brave the storm ; it has cured many a painful malady : but it has also, in many cases, shortened the thread of life. For where we see such multitudes cast themselves into the briny flood

without any previous advice, it would be very fortunate, indeed, if they all belonged to a class likely to be benefited by its use.

Real plethora, or fulness of habit, which shows itself by a strong and full pulse, resisting the pressure of the finger, by the distention of the veins, by an intense redness of the skin, by an active production of warmth, and is often accompanied with indolence of the animal and intellectual functions, does not agree with sea-bathing. It is evident that a morbid disposition, which requires evacuations, and a spare, cooling, antiphlogistic diet, must be aggravated by so stimulating a remedy. Sea-bathing is still more improper where active congestions to the brain, the lungs, or the heart, have already been observed, or where they are favoured by a peculiar formation of the body, such as shortness of the neck and curvature of the spine. For passive congestions, on the contrary, which are more of a venous nature, and the result of the weakened vitality of an organ, it is, in many cases, an excellent remedy, as it not only fortifies the debilitated part, but

tends also to equalize the distribution of blood throughout the whole economy.

Organic defects in important organs, such as hypertrophies, indurations, softenings, cancerous and fungous degenerations, internal and external aneurisms, &c., &c., expressly forbid the use of sea-bathing. Individuals with a weak breast must be particularly careful how they use the bath, and take proper advice before having recourse to it. Sea-bathing is far too stimulating a remedy for very young children. Before the second year is accomplished, warm sea-baths are preferable, particularly before the process of dentition has terminated, for here every violent excitement is to be carefully avoided, as it would undoubtedly increase the tendency of the blood to the head, which is so frequently the cause of fatal convulsions.

There are many reasons why aged individuals should bathe only with the greatest circumspection. At an advanced period of life, the disposition to diseases of the brain, such as congestions, apoplexy, softening of that organ, is so very great, that all influ-

ences that tend to accelerate the circulation and to excite the nervous system, must studiously be avoided. Organic diseases very often exist in a latent state, when man is already far on his way into the vale of years, and only remain unperceived because, as long as a quiet and regular way of living is pursued, the diseased organ is not called upon for any great exertion, and the whole body has gradually conformed to its diminished action; but as soon as any extraordinary excitement takes place, then the conditions cease under which a tolerable degree of health had been maintained, and the evil, roused from its slumber, easily triumphs over the slight resistance of an effete organisation. That in all such cases, which are by no means common, sea-bathing must be a poison, certainly requires no further comment.

Opinions are divided as to the question whether it ought to be allowed during pregnancy. Where abortions have already taken place, and the constitution is very irritable and nervous, the commotion produced by the shock of strong waves or by a very cold


bath would undoubtedly be dangerous, but experience teaches us, that in many cases the prudent use of sea-bathing, has been of great service both to mother and child, and that by strengthening the constitution, it is an excellent means for preventing the danger of premature confinement.

CHAPTER IV

THE INDISPOSITIONS WHICH FREQUENTLY TAKE PLACE
DURING A SEA-BATHING CURE.

THE more active vitality which developes itself in all organs during the course of a sea-bathing cure, necessarily gives rise to manifold functional modifications, which not seldom assume the character of slight indispositions.

Thus, the skin being exposed to the immediate stimulus of the salt water, frequently exhibits symptoms of irritation. A prurient sensation, increasing in the warmth, so as to disturb the night's rest, is often felt over a great part of the body, accompanied either by a simple redness (erythema), or a miliary eruption, consisting of small, light red, strongly itching papulæ, collected in groups or disseminated. After a few days, the skin having got accustomed to the action of the salt-



water, these slight affections generally disappear, and it is not necessary to interrupt the bath on their account ; but sometimes more violent symptoms of cutaneous irritation take place, such as erysipelas, with a considerable swelling of the affected part, nettle-rash, painful boils in different parts of the body ; and in these rare cases the bath must be discontinued until the irritation of the skin has been appeased by an appropriate treatment.

The hair frequently falls out in greater quantities, which is not seldom alarming to ladies, who fear the loss may be irreparable. The use of a water-tight bathing-cap is considered as the best defence against this imaginary danger ; but in this case the remedy is certainly worse than the evil, as it not unfrequently causes head-ache and congestion, particularly when it is tied too tightly, and plunging in neglected ; whereas, the hair having been freely exposed to the ocean, grows after a few weeks more luxuriantly than ever. This is the natural consequence of the improved vitality of the scalp, so that the contact of sea-water, far from injuring

the growth of the hair, ought rather to be considered as an excellent remedy in all cases where its loss is the consequence of general or local weakness.

Digestion is frequently disturbed during a sea-bathing cure. This is sometimes owing to the increase of the appetite, which easily leads to over-indulgence, but more commonly to the circumstance that the digestive organs being, like every other part of the body, under the influence of a powerful stimulus, and consequently in a state of considerable vital excitement, are thereby rendered very susceptible of derangement. Weak, sensitive, and nervous individuals particularly, should never lose sight of this fact, and bear in mind that the success of their cure depends in a great measure upon their following a moderate and regular diet. Should symptoms of a spoiled stomach occur, such as want of appetite or aversion to food, a bad taste, a furred tongue, acid or foetid eructations, heart-burning, headache, general lassitude, the bath must be immediately suspended, and means taken for the speedy removal of the impurities.

Constipation frequently takes place during the first days of a sea-bathing cure, and must on no account be allowed to continue, as bathing only agrees well with an open body. Particularly when constipation occasions symptoms of congestion, such as head-ache and heaviness of the head, some slight and cooling aperient (electuary of senna, tamarind-whey, sedlitz powders, or a dose of salts), must be used without delay, and bathing discontinued until the remedy has had the desired effect. All constipating food, such as fresh bread, heavy pastry, flour puddings, fresh cheese, and nuts, must, of course, be avoided.

In other cases a diarrhoea makes its appearance, without any fault in the diet having been committed or cold taken, in consequence of the increased vital activity of the organisation striving to remove superfluous or unwholesome humours. It must, therefore, be considered as a salutary effort of Nature, and requires neither medicine nor an interruption of bathing, as long as the appetite remains good, and no other inconvenience is caused by it. Should it last longer than a few days,

a small tablespoon full of infusion of rhubarb twice a-day is the best remedy. All sour aliments, fruit and beer, must, of course, be abstained from during its continuance.

Vomiting, without any symptom of spoiled stomach, occurs now and then in very sensitive subjects during the bath or immediately after. A slight anti-spasmodic, such as a few drops of tincture of valerian or ether, will prevent its recurrence.

All prolonged and often-repeated excitement naturally causes fatigue, particularly in weakened constitutions: no wonder, then, that the sea-bath, which so powerfully stimulates the nervous system, frequently gives rise to a great degree of lassitude, so that many bathers complain that they are the whole day sleepy, and every movement is a toil to them. This feeling of weariness and bodily exhaustion affects also the spirits, and the disheartened patient begins to lose confidence in a *strengthening* remedy which occasions all the symptoms of weakness. To prevent fatigue as much as possible, feeble and sensitive individuals must bathe only every other day, re-

main but a very short time in the water, take some wine or beef tea immediately after, and abstain from all excitement.

Sometimes, in spite of every precaution, a proper reaction will not take place, so that cold, shivering, trembling, and a feeling of excessive fatigue and exhaustion continue for hours after the bath. In these cases warm sea-bathing, and the invigorating influence of sea-air, must prepare the body for its use. In consequence of the general excitement of the system, the night's rest is frequently disturbed during a course of sea-bathing, and requires a calming regimen to be strictly followed. The patient must take his cold and moderate supper not later than an hour before going to bed, and entirely abstain from all spirituous liquors. The following powder (nitrate of potash and sulphate of potash, five grains each, milk-sugar ten grains), dissolved in half a wine-glass of water, will be found an excellent remedy for abating the tumult of the nerves. Should all these precautions be of no avail, then bathing must be interrupted for a day or two.

Head-ache not rarely occurs during the sea-bathing cure. Sometimes it is of a congestive nature, and then principally appears in plethoric individuals, accompanied with giddiness, drowsiness, and a sensation of general fatigue. It may proceed from constipation or neglecting to wet the head before entering the water, or not sufficiently plunging, or allowing the strong waves to strike against the head, or remaining too long in the sea, or following too stimulating a diet, &c. Cooling and aperient medicines must be used, and the bath suspended for a day or two. In other cases the head-ache is of a nervous nature, particularly attacking weak and sensitive individuals. Sometimes it makes its appearance immediately on entering the water, and ceases after a short continuance; but in other cases it is uncommonly obstinate and painful, so as to oblige the patient to give up bathing altogether.

Fainting not unfrequently takes place, either in the water or after the patient has left the bath. Delicate females are very liable to it. It may be caused by fear, or bathing

on an empty stomach, or remaining too long in the water. Such individuals should take some wine, or eat a piece of bread before they bathe. Other nervous symptoms, such as great anxiety, palpitation of the heart, neuralgic pains, spasms, &c., are also of frequent occurrence, and generally disappear after the first baths.

Irregularities of the menses often take place during a course of sea-bathing. Sometimes the catamenia appear before the usual time, in other cases they retard or last longer than usual. Where the economy is exposed to an influence which so energetically stimulates and modifies its vital action, it is by no means surprising that these transient changes should take place. Alarm on their account is perfectly groundless, unless they are accompanied with other symptoms of illness. Bathing must be discontinued during the menstrual period, as its sudden suppression or the increased loss of blood might lead to the most dangerous consequences.

CHAPTER V.

THE SALUBRITY OF THE SEA-AIR.

WHAT a contrast between the polluted atmosphere of cities and the pure sea-air ! We breathe it deeply and luxuriously, as though we were quaffing some delicious beverage, and instinctively feel that the soft breeze conveys health and vigour on its balmy wings. That in this instance our sensations do not deceive us, is fully borne out by the experience of centuries. Small islands and peninsulas have ever been the cradles of a green, old age. Man lives longer in England than in Germany ; longer in the isles of Greece than in Asia Minor ; longer in Japan than in China. Scotland, Denmark, and Norway, countries that not only possess very extensive coasts in proportion to their size, but are moreover deeply indented with numerous friths, which carry far inland the influence of the bracing sea-atmosphere, furnish

us with many instances of extreme longevity. But we need not go to distant countries for proofs of a fact which can so easily be ascertained by personal observation. The robust frames and vigorous health of mariners, and of all who habitually breathe sea-air, must strike even the most inattentive visitor to the coast.

How many pale, languid, and sickly children, in whom all energy seems extinct, are not yearly brought to the margin of the ocean? and as day after day they play on the beach, what a remarkable change comes over them? The ruddy glow of health gradually overspreads their sallow cheeks; their appetite and digestion improves; their muscles become firmer; their step more elastic; and their morbid listlessness is succeeded by such an exuberance of mirth and spirits, that after a few weeks one hardly knows them to be the same.

Effects such as these could not fail to attract the attention of physicians ever since medicine began to be practised as an art, particularly as the first dawn of science arose

on the isles and along the coast of the Mediterranean. Twenty centuries ago the wealthy Romans used to spend part of the year on the delightful shores of Campania, to restore, by the invigorating sea-breeze, the tone of their languid frames, enervated by excessive luxury. The Emperor Augustus, whom his physician, Musa, had cured of a dangerous illness, against which all other remedies had failed, by cold bathing and a cold regimen, ever after made annual maritime excursions round Cape Misenum, for the benefit of his health; and his successor, Tiberius, who had paid so great an attention to the rules for its preservation, that he pronounced every man to be grossly ignorant, who after thirty still required to consult a doctor on that subject, did not select the small island of Caprea for his permanent residence, without having well calculated the probable influence of sea-air upon the prolongation of his existence. It was thus that Augustus attained the age of seventy-six, and Tiberius that of seventy-eight years—a long period for men whose shoulders were burdened with the government of the world.

The sea-air proves itself particularly salutary in diseases of the respiratory organs. Wherever pulmonary consumption looms in the distance, no remedy holds out a fairer prospect for parrying its attacks. Pliny, Celsus, Boerhaave, Cullen, Sydenham—with one word, all ancient and modern authors of note who have written on that insidious and inexorable malady, agree with one accord in recommending sea-voyages as the best preservative against it. Many a chronic catarrh or bronchitis has been cured by sea-air, which by stimulating the action of the skin diminishes the excessive secretion of the mucous membrane of the bronchi, and raises at the same time the energy of the lungs by affording them their natural stimulus in its purest, and, consequently, most congenial state. This sufficiently explains why catarrhal affections are uncommonly rare during long sea-passages, and gradually increase in violence and frequency as we advance into the interior of continents.

James Floyer, who at the end of the seventeenth century wrote the first treatise on asthma, and as he himself suffered from that

complaint, may deservedly rank as a double authority, particularly recommends sea-air in all cases of this kind; and it is well known that many asthmatical patients can only find relief while breathing on the sea-side.

We will now investigate the peculiar qualities to which sea-air owes its remarkable salubrity.

Atmospherical air consists of twenty-one parts oxygen gas and seventy-nine parts nitrogen in one hundred parts, and this proportion is found to be everywhere the same—on the highest mountains and in the deepest valleys, on the sea and in the interior of continents; but as, owing to the increasing pressure of the superincumbent atmosphere, its density augments as we descend to the level of the sea, it is evident that we here inhale at every breath a greater quantity or weight of air, and consequently of oxygen, than if we were raised a few hundred feet higher. The oxygen we breathe unites with the carbon of our venous blood, and thus forming the carbonic acid gas which we exhale, disengages the animal warmth which is necessary to our existence.

Now it is evident that the more carbon we consume, the greater quantity of food we require to repair the loss. Thus, the greater density of sea-air causing a more rapid consumption of carbon, cannot fail to increase the appetite and stimulate the vegetative processes, that are silently, but constantly, effecting a change within us.

At the same time the air on our coasts is in a continual agitation, a circumstance by which cutaneous transpiration is very much promoted. This will easily be understood if we picture to ourselves our skin as a membrane filled with fluids, which continually evaporate through its porous surface. When the air is stagnant and saturated with aqueous vapours, it is little inclined to receive a fresh supply of moisture; but an agitated atmosphere constantly renews the stratum of air which is in immediate contact with our skin, and dissipates its exhalations as quickly as they form. While thus the nimble sea-breeze increases and favours cutaneous transpiration, by means of which so many noxious humours are removed, it greatly contributes to the

cleansing of the blood and the furtherance of a healthy vegetation.

In the interior of the country the air is subject to greater variations of dryness and humidity; on the coast it is more uniformly moist, and, consequently, more soothing and agreeable to the respiratory organs. The temperature is also less variable on the coast than farther inland. During the heat of a summer's day the evaporation of the sea cools the sheet of air immediately above its surface, which, displacing the lighter air, warmed by the contact of the soil, is felt on shore as a delightful breeze. After sunset, on the contrary, the surface of the sea does not so rapidly cool as that of the dry land; and thus, in virtue of the physical law by which all neighbouring bodies tend to equalize their temperature, imparts comparative warmth to the vicinity. For this same reason, the winter on the coast is generally milder than in the interior. But a greater uniformity of temperature is very conducive to health and longevity, for we all know how many fatal diseases are caused by a rapid rise and fall of the thermometer.

The pernicious influence of an air saturated with animal or vegetable miasms is too well-established a fact to need any further comment; for it has been proved over and over again, that mortality is not only greater in large towns than in the country, but augments also in the same proportion as the population is more crowded in narrow streets and alleys, and as drainage and ventilation are defective. Now, nothing can be more unlike this vitiated atmosphere than the pure sea-air, which must, therefore, be as salubrious as the former is detrimental to health.

Among the many noxious or deleterious substances mixed up with air, carbonic acid gas deserves a particular notice. It is the produce of every combustion, and is exhaled by all animals *constantly*, by all plants *after sunset*. It is so universally spread over the atmospheric ocean, that the air is nowhere entirely free from it; but still it is found in greater quantity over land, where it is perpetually produced from so many sources, than over the sea, by whose agitated surface it is continually absorbed. Carbonic acid is

a poisonous gas, and although the free atmosphere generally contains only so small a quantity, that it would be an exaggeration to ascribe any considerable influence to its presence, still, it must be allowed that sea-air, which contains less of it than any other air we know of, is thereby entitled to the praise of a peculiar purity

While the sea-air is thus free from many pernicious substances, with which it is elsewhere tainted, it contains others of a very different nature, which are esteemed as powerful remedies against many diseases; for every wind that wafts over the ocean is saturated with saline particles, which we can easily taste on our lips while wandering on the shore. But even in the calmest weather, the evaporation of the sea constantly imparts salt and free muriatic acid to the atmosphere, as the great Berzelius, among others, has clearly proved in his "Annals of Chemistry," and as is now no longer doubted by any one conversant with that science. These saline and acid particles are unquestionably one of the causes why one is not so apt to catch cold on the

coast, for by constantly stimulating the skin they prevent transpiration from being easily checked. They also stimulate the mucous membrane of the respiratory organs, and tend to correct its relaxation. Inhaled with the atmosphere they purify the blood.

Iodine and bromine have also been discovered in sea-air, and however minute their quantity may be, their influence must not be overlooked, as it is felt at every breath, and is thus uninterruptedly active.

The peculiar salubrity of sea-air must also partly be ascribed to its electrical properties, for Pouillet found that when a saline solution evaporates, electricity is constantly developed. "But electricity," says Humboldt, "has a manifold connection with all the phenomena of the distribution of warmth, of the pressure of the atmosphere, and its perturbations. It has a great power over the whole animal and vegetable world, not only through meteorological processes, but through its direct influence over the nerves and the circulation of fluids." (*Kosmos*.)

Thus the sea-air has many valuable proper-

ties, by which it is more or less distinguished from land-air,—generally a greater density, and, consequently, a greater quantity of oxygen in the same volume; constant agitation; a more equal temperature and moisture; a greater purity; an admixture of saline particles; a peculiar electrical state:—and the united influence of all these characteristics sufficiently accounts for its eminent salubrity.

We have no doubt that the more generally the peculiar nature of sea-air becomes known, the greater recourse will be had to it for the benefit of mankind. Schools and institutions should have their seat near the sea-shore, for here the health of youth may be strengthened without any impediment to the acquisition of useful knowledge, and the soul at the same time widened by the contemplation of Nature's grandest scenes. Sanatoriums, asylums, and many hospitals for chronic diseases, would here have the best situation, for surely where so many salutary agencies can be had without any cost, a wise economy prescribes them to be used.

CHAPTER VI.

THE INFLUENCE OF THE SEA AND ITS PHENOMENA
ON THE MIND.

HAPPY is the sojourner on the coast who has a taste for the beauties of Nature; who, while wandering on the shore, not merely inhales the refreshing breeze, but finds at the same time in the contemplation of the sea a never-failing source of enjoyment and reflection.

The change of ebb and flood, always the same and yet always new; the murmuring of the waves which *was* long before man was born, and *will be* long after all existing nations have passed into obscurity; the boundless plain of waters, and the no less boundless horizon above; the wonderful phosphorescence of the sea, illumining the night with magic fires; all these are aspects and phenomena that forcibly strike his imagination, and raise his mind above the petty

vexations of the moment, by the soothing and elevating ideas they inspire.

But we all know how great an empire the soul has over the body! that as melancholy and grief slacken our pulse, destroy our appetite, and make all our movements languid; thus also a joyful exuberance of spirits gives elasticity to our step, and colour to our cheeks. The impressions which a visit to the coast makes on the feeling and reflecting mind (and insensible indeed must he be for whom scenes like these have no language), are therefore by no means to be overlooked among the strengthening influences of sea-bathing.

For if the shock of the waves, by invigorating our body, improves, at the same time, the weakened energies of our mind, there can be no doubt, that the great and beautiful phenomena which Nature displays to us on the coast, act through the mind on our bodily health and assist in restoring it.

We are therefore of opinion, that by calling the attention of our readers to the wonders of the deep, and lingering a little while with them on the shore, we do not deviate too

far from our subject: for surely the better we become acquainted with the nature of the phenomena which are here exhibited to our view, the deeper must be the impression they make upon our minds.

Thus the regular succession of ebb and flood may, perhaps, fail to strike the careless observer; but what a train of ideas does it not awaken in him who reflects on its causes and effects! As he witnesses the rise and fall of the waters, his thoughts at once fly to the celestial bodies, from whose power of attraction the phenomenon proceeds, and he is reminded, by a beautiful example, of the great law of universal gravity which governs the movements of worlds. But soon a feeling of gratitude mingles with his admiration, when he further reflects how man is directly benefitted by its effects; how the tides forcing the rivers to remount against their sources, waft richly laden fleets into ports far distant from the sea, and cause the stately city to rise, where but for them, some nameless village might have stood.

Thoughts such as these cannot fail to have

a salutary influence on the mind of the patient as he walks along the margin of the sea. The sea-plants, shells, and animals he gathers on the shore, are likewise a source of never-failing interest. The beauty of many, and the strange forms of others, so different from all he has been accustomed to see, attract his attention and give him an enlarged idea of the boundless variety of Nature.

If he has the eye of an artist, the sea is rich in attractions of another description. The effects of light and shade, as they play upon the bosom of the waters and tinge the clouds fantastically grouped; the sunbeam glancing upon some distant sail; the gracefully curling waves dissolving in milk-white foam, and racing along the coast; sometimes all the colours of the rainbow, and then again one uniform grey; calm succeeding agitation, and the storm raising mountain-billows, where, an hour before, the sea was placid as a lake; all these varieties and changes, which continually present new pictures to his view, will delightfully occupy many an hour.

But the sea is not only rich in magnificent

aspects during the day-time; it frequently exhibits its most wonderful scenes long after the sun has disappeared from the horizon. Especially in warm evenings, towards the close of summer, a brilliant phosphoric light is emitted from the waves as they break along the shore, or else it streams forth wherever a breeze sweeps over the surface or a boat divides the waters. Beautiful as is the phosphorescence of the ocean, our wonder increases when we are informed that all seas are illumined by it, and that each of the countless luminous points scattered through the wide expanse, proceeds from the vital energy of an organized being. Almost all the lower marine animals, the jelly-fish or *Acalephæ*, and a host of microscopic *Infusoriæ* have the property of emitting light, but the one most common on our shores is a minute Jelly-fish, or Medusa (*Noctiluca miliaris*), about the size of a pin's head, which particularly in calm, warm weather, comes to the surface of the water, and lines the coast in countless myriads. If one fills a glass with phosphorescent seawater and lets it stand, one will find on

the following morning a number of small bodies floating on the surface, that are almost entirely transparent and colourless, with the exception of a small milk-white spot. Viewed under a microscope, they appear as globular animals with a little cavity or indentation, from which springs a thread-like tentaculum, slowly moving backwards and forwards. That this little creature is the cause of the brilliant phenomenon which strikes us with astonishment and wonder, can very easily be proved, for when phosphorescent water is passed through a filterum, it loses altogether the property of shining in the dark, while the *Noctiluca* collected on the filterum continue to emit light when slightly agitated. When a bottle containing *Noctiluca* is gently shaken, one sees in the dark, small luminous points descend and reascend in the liquid, in the same way as during day-time, under similar circumstances, the small globules are seen to move about.

Thus the *Noctiluca* affords us a beautiful example of the great effects which Nature produces by the immense multiplication of

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creatures individually insignificant. But it is not the only object that may serve to give us an idea of the innumerable swarms of animated beings that people the ocean. For miles and miles along the shore, the strand is covered with minute fragments of shells, which the rolling of the surf gradually pulverizes and the winds scatter away. All these were once the coats of living animals, and not a day passes that new myriads are not cast ashore, which in their turn disappear.

THE END OF THE FIRST VOLUME

CHAPTER VII.

GENERAL DIRECTIONS FOR SEA-BATHING.

SEA-BATHING can only do good when used moderately, and the proof that the just medium has been observed, is found in the character of the reaction which it calls forth. An agreeable feeling of elasticity and vigour after leaving the water is a sign that a strengthening effect has been produced; but where symptoms of congestion show themselves, such as head-ache, and oppression on the breast, attended with general excitement, or where the body cannot recover its warmth; and nervous symptoms, such as shivering, spasmodic rapidity of the pulse, and a feeling of great weakness and lassitude make their appearance, there the system either reacts too violently or not in a sufficient degree, and in both cases the bath will not have

produced a salutary result. Every circumstance which might bring about one or the other of these two extremes is, therefore, carefully to be avoided; and all rules or directions for sea-bathing will be found to have a reference to this one fundamental principle.

As long as the patient still feels fatigued or any way indisposed from his journey, he should not think of bathing. The day after his arrival ought to be devoted to rest; frequently even he will do well to wait a few days before he bathes, for the bracing sea-air has in itself a powerful effect upon nervous and debilitated organisations; in the beginning it frequently excites and disturbs them, and their first bath is much more likely to agree with them after their sensitive frame has become more habituated to the change of air.

Where the patient is very irritable or weak, or unaccustomed to cold-bathing, so that too violent an effect might be apprehended from the first immersions, or where the weather is unpropitious on his arrival, it will be ad-

visible for him to take two or three preparatory warm sea-water baths, whose temperature may be daily diminished, so as gradually to pave the way for bathing in the open sea. Where the excretions are obstructed, and particularly where there exists a congestive tendency to the head or breast, the body must be well cleansed beforehand by . cooling aperients.

Before entering the water the bather must on no account be overheated by exercise, as immersion in cold sea-water can only be injurious when the system is already in a state of excitement. On the other hand, reaction takes place with greater difficulty when the circulation has been previously depressed by the prolonged influence of a low temperature. For this reason delicate individuals do well to take some gentle exercise before bathing, so as to produce an agreeable warmth over the whole body; of course, without overheating it.

When the patient is incapable of walking, frictions must be made with a flesh-brush or a flannel cloth over the whole body, and

particularly over the back, breast, and pit of the stomach.

All strong emotions, whether of an exciting or depressing nature, are to be avoided ; thus, children ought never to be bathed while under the influence of excessive fear:—they must be coaxed, not forced, into the water.

To bathe with a full stomach is extremely dangerous. If even in ordinary life, all mental or bodily exertion, soon after a somewhat copious repast, is found to be prejudicial, it may easily be imagined how much digestion must be disturbed by so violent an action as that of sea-bathing. Three or four hours, at least, must elapse after a hearty meal, before it can safely be thought of.

The first impression of the cold is always more or less disagreeable, particularly to a beginner ; but as delay and hesitation not only increase its unpleasantness, but are serious obstacles to a proper reaction taking place, it must be overcome as soon as possible. Where the bather cannot summon sufficient resolution to make a few steps forwards, after previously throwing some water

over his forehead and breast, and then boldly to plunge or to turn his back to the first advancing wave, which will immediately change the primary disagreeable impression of the cold into a delightful sensation of warmth and refreshment, the best plan is to allow himself to be carried to a sufficient depth, and then to be suddenly immersed, or else to have a pail of sea-water poured over head and shoulders, while standing at the foot of the machine.

Every visitor to the sea-coast must have observed bathers, who, incapable of the least resolution, stand shivering in the breeze, enjoying all the time a cold foot-bath. That patients such as these, instead of feeling a refreshing glow on leaving the water, complain of a universal chill, from which they with difficulty recover, and eventually return to their homes, without having derived any benefit from the sea, can surely be no matter of surprise to those who have witnessed their proceedings. It is evident that a favourable result can only be obtained by following a very different plan; by plunging repeatedly, allowing the waves to strike against the back

and shoulders, and freely moving about in the water. The exertions of the bather must, however, be regulated by his strength; for while a vigorous and healthy man may swim a long time without any evil consequences; fatigue is studiously to be avoided by the patient who comes to the coast in quest of health.

In many cases it will be found useful to rub the suffering part while in the water, and expose it more particularly to the shock of the waves: it would, however, be dangerous to let them strike with any violence against parts which cannot stand a strong concussion, such as the pit of the stomach or the breast. If allowed to dash against the head with any degree of violence, headache, giddiness, and congestion will be the consequence.

Some brisk exercise must be taken after the bath, just enough for promoting reaction without causing fatigue, and if, even then, it does not sufficiently develop itself, some port wine, sherry, or beef-tea, will be found very useful adjuvants. When the patient is incapable of walking, he must, as

soon as possible, be put into a warm bed. The duration of the bath is a question of great importance. As a general rule, one should always leave the water while the glow or reaction, following upon the first impression of the cold, is still in its full vigour. In this case a pleasant feeling of warmth will last the whole day; while by continuing in the sea so long as to allow the cold to overpower the reaction, one will find it very difficult to restore the temperature of the body, and have to contend for hours together with disagreeable sensations. Thus, our feelings tell us plainly that in the first case we have increased our strength, while in the second, we have wasted by overtasking it. Even a strong and healthy individual feels better after a short bath of five to ten minutes duration; but the patient must be particularly careful not to exceed the limits of his weakened energies. Thus he will generally find two or three immersions quite sufficient for the beginning, until his growing strength gradually enables him to support a longer bath.

We have finally to consider which is the

proper time for bathing? Early in the morning all external influences make a deeper impression upon our body; the air and water are generally colder; a bath before breakfast is, therefore, more powerful, but at the same time, more fatiguing. Most patients are too weak to bear so great an exertion on an empty stomach, and will find it more advantageous to bathe two hours after their morning meal. There are many nervous individuals, who, feeling extremely languid and depressed the whole morning, acquire a greater degree of strength and vivacity as the day advances. In these cases the bath should be taken in the afternoon. Children ought never to bathe before eleven in the morning, nor in cold and rainy weather.

CHAPTER VIII.

THE REGIMEN TO BE FOLLOWED WHILE USING THE SEA-BATH.

THE mere use of the sea-bath would be of no great avail to the patient, if he did not at the same time follow a regimen calculated in every respect to assist its good effects.

The invigorating influence of sea-air is scarcely second to that of sea-bathing itself; he will, therefore, consider every hour as lost that he is condemned to spend within doors, and make the beach his head-quarters, hastening to it early in the morning, and reluctantly leaving it with the setting sun. While sitting near the margin of the sea and listening to the murmur of the rising flood, which has so soothing an influence on irritated nerves, he will feel himself inhaling health with every breath, and repairing without effort

the ravages which disease or over-excitement have made in his constitution.

Want of exercise is the fertile source of many disorders. A sedentary life weakens the whole body, makes the nerves irritable, retards the circulation of the blood, and causes it to stagnate in the relaxed veins, particularly of the abdominal organs. Digestion consequently suffers ; the secretions, so necessary to health, are diminished, and the humours become vitiated. A degree of exercise proportionate to the vigour of the body is, on the contrary, a most powerful means, not only of preserving health, but frequently also of restoring its integrity, without the use of any internal medicine whatsoever. The sea-bather will, therefore, not rest satisfied with inhaling as often and as long as he can the healthful sea-breeze, but at the same time take as much exercise as his strength allows; not forgetting however, that like all good things, it may become injurious by excess, or when taken at an improper time. While the strong and healthy man can walk for hours together along the beach, the valetudinarian must always bear

in mind that his energies are but weak, and that over-exertion is sure to retard him on his way to health; he will, therefore, content himself with short walks, which he may several times repeat during the course of the day, and devote with great advantage many hours to the less fatiguing use of passive exercise.

Daily rides along the strand are in almost all cases very favourable to health, and will materially assist the effects of sea-bathing, particularly in hypochondriac and hæmorrhoidal affections, and where the circulation in the viscera of the abdomen is languid or obstructed. Riding is not only useful through the gentle concussion of the abdominal organs which it produces, promoting thereby the circulation of the blood in these parts, but also by occupying the attention of the patient, particularly if he is a novice in the equestrian art, and diverting his thoughts from the eternal contemplation of his wretched state of health. This remedy was so highly esteemed by the illustrious Sydenham, that he deemed it as efficacious for hypochondria as bark for the intermittent fever.

Boating is another very salutary mode of enjoying passive exercise. The sea-air is nowhere purer than on the bosom of Ocean itself, a few feet above its surface, and the moral impression of the unaccustomed undulating motion upon nervous patients, must also be taken into account. Sometimes seasickness disturbs, it is true, the pleasure which boating otherwise so highly affords; but the cases where it might be injurious are uncommonly rare, while those where it positively assists the action of sea-bathing, by stimulating the nerves of the stomach, or rather the entire ganglionic system, are very frequent.

Besides being careful not to overtask the strength, delicate and nervous patients should never take exercise immediately before dinner, as even a slight fatigue is apt to weaken their appetite; and rest for an hour at least after, as any exertion, while digestion is in full activity, necessarily disturbs it. They must not walk out early in the morning before having breakfasted; for in all cases of debility, exertion on an empty stomach causes great fatigue. The best time for a

a walk is undoubtedly an hour after breakfast or lunch, or two hours after dinner.

Great attention must be paid to the clothing while on the coast. The mornings and evenings are generally cooler than in the interior of the country, and the perpetual agitation of the atmosphere easily produces a sensation of chill, by increasing evaporation on the surface of the skin.

Woollen stuffs of a tissue proportionate to the season are very much to be recommended; for being bad conductors of heat, they are better able to preserve an equal temperature of the skin. The chief occupation of children that are brought to the sea-shore for the benefit of their health, is playing on the strand, where they generally find great amusement in throwing up little fortifications, which the next flood destroys. As they are here at work like daily labourers, and an excellent work it is, repaying itself with a rich harvest of strength and spirits;—great elegance of dress would be completely out of season; all that is required of it being a convenient width, so as to give free room to every motion,

and sufficient protection against the changes of temperature, without being so warm as to produce a debilitating perspiration.

The great object of sea-bathing is to strengthen and fortify the constitution, and this can only be attained by following at the same time a strengthening diet. For sea-bathing in itself is only a means to that end; it fortifies only by giving a more vigorous impulse to the vegetative functions, and thus increasing the *real* want of nutritious food, which being converted into blood of a better quality, improves the condition of the solid parts. Thus a most important link would be wanting in the chain which leads to health, if the food of the patient were not sufficiently nourishing. But at the same time great care must be taken to avoid every excess. As sea-bathing and the bracing sea-air give an unaccustomed zest to the appetite, one is but too easily led to over-indulgence, which necessarily spoils the stomach, and prevents the progress of the cure. It should also be remembered, that the whole body is more or less excited and fatigued while using the sea-bath,

particularly during the first weeks, and that the powers of digestion, far from being increased in the same ratio as the appetite, require even more than ordinary attention. Thus, all food, which is not easy of digestion—all made-up dishes and ragouts—all heavy paste and fresh bread must be carefully avoided. A plain dinner, consisting of roast or boiled meat, with vegetables, will afford all the nourishment that is required, without tempting the patient, by a greater variety, to indulge too freely in the pleasures of the table.

Scrofulous children should breakfast between eight and nine, and take an egg or a little meat at this meal. They should have a sandwich about twelve or one o'clock, and meat with their dinner at three. Some good beer, or a glass of wine, should be allowed, which will assist digestion by stimulating the secretion of the gastric juice. Their meals must be taken at regular hours, and no sweetmeats or cakes given to them during the intervals. They should also be taught to eat slowly, and properly to masticate their food.

Late hours and evening parties do not agree with sea-bathing. For it stands to reason, that after spending the greater part of the day in the open air, and taking plenty of exercise, besides bathing, one must feel the necessity of repose sooner than usual; and that as the sea-bath rouses the whole economy, and frequently causes restlessness, everything must be avoided which might still further stimulate the system. The patient will therefore do well to devote the latter part of the day to tranquil enjoyments, and to retire to rest an hour before the usual time. Sleep soon after any of the meals is not to be encouraged; but many nervous and debilitated patients feel after their bath an irresistible longing for repose, and when they find, by experience, that a little slumber refreshes them, there is no reason why they should not indulge in it. When the head is found to be heavy after sleep, it is a sign that it is injurious, and it must then be abstained from for the future.

The cares and anxieties of business, as well

as all mental exertion, must be as much as possible banished during sea-bathing. For the brain partakes of the general excitement, and is consequently less able to bear fatigue than in the usual course of life. Pleasant conversation, or some light amusing reading, will be found to assist the cure ; but anything like intellectual toil would be positively injurious, and prevent the nervous system from repairing its energies.

CHAPTER IX.

THE WARM SEA-WATER BATH.

THE warm sea-water bath is either used as an exclusive cure, or preparatively to the cold sea-bath, which it resembles with regard to its tonic and stimulating properties, although the means by which it produces its effects are widely different. For here, instead of the united influence of a low temperature and the shock of powerful waves, which speedily provoke a mighty reaction, and rouse vitality in every part of the body, we find the active agencies of warmth joined to the stimulus of salt, and to the absorption of saline particles. The warm temperature of the bath immediately causes a more copious flow of blood to the skin and outer parts, which in this case is not followed, as after the common warm bath, by a sensation of weakness, languor,

and chill, but by an agreeable burning in the skin, and a feeling of increased vigour. These strengthening effects are owing to the stimulating properties of the salt, which undoubtedly plays a greater part in the warm bath than in the cold, as the higher temperature of the water immediately excites the vitality of the skin in a considerable degree, and thus increases its susceptibility for other impressions.

As warmth dilates the skin, it also favours absorption, which here therefore takes place in a much greater ratio than in the cold bath. The saline particles thus received into the blood, have a powerful effect upon the vegetative process, by promoting the activity of the lymphatic vessels, so that next to the strengthening effect of the warm sea-bath, its resolvent properties must not be overlooked.

The use of the warm sea-bath improves the nutrition of the skin, increases the firmness of its tissue, and gives greater strength and activity to its functions, enabling it better to withstand changes of temperature, and not only curing a great many cutaneous diseases,

but proving also an excellent remedy for a number of internal complaints, which are either caused or aggravated by the inadequate performance of the functions of the skin. At the same time, the mucous membranes of the respiratory and digestive organs acquire a greater firmness; so that many diseases which had been caused by their relaxation or weakness, speedily assume a better character, and are eventually cured.

Thus, bronchial catarrhs of a chronic nature, or serous and mucous diarrhoeas in scrofulous children and delicate females, diminish and cease under the influence of the warm-bath.

It is an excellent remedy for scrofula. Many irritable and scrofulous children, suffering from want of appetite and weakness of digestion, acquire, after a few baths, a better appetite and a greater power to digest substantial and nourishing food. They increase in strength and volume; serous infiltrations of the face and limbs; habitual swellings of the lips, the nostrils, and joints disappear.

All these facts sufficiently prove that the

action of the warm sea-water bath, although not near so energetic as that of the cold bath, is of an analogous nature; and that in all cases of debility and languor of the vegetative process, where a strengthening effect is required, but where a violent excitement of the whole system does not seem desirable, it is a far preferable remedy.

In elderly individuals its use is frequently productive of the best results, particularly against weakness of the digestive organs, of the skin, and of the mucous membranes; or where the constitution has been shaken by strong emotions or a severe surgical operation, or weakened by a sedentary life, a long illness, or a painful convalescence. At this age warm sea-water baths are found to be efficacious against many diseases, for which warm sulphurous springs are also an appropriate remedy; such as neuralgic affections and rheumatisms, particularly where the latter have a tendency to attack the respiratory and digestive organs. Their use is also very much to be recommended to all patients whose nerves are too irritable to oppose a sufficient

resistance to the spasm, which is the first effect of an immersion in cold water, or who are too weak to bear any great loss of animal warmth, and find great difficulty in repairing it; for children who have not yet completed their second year, who habitually cough, who, in consequence of original or acquired weakness, are very deficient in reactive power, who have a livid colour, soft flesh, and meagre extremities; for nervous and hysterical females, who are terrified at the idea of bathing in the open sea, and cannot summon sufficient resolution for that purpose; for individuals, on whom the cold bath makes so violent an impression, that its repetition would be dangerous.

The temperature of the warm sea-bath must generally not exceed 87° to 89° , as the united stimulus of the saline particles and a high degree of warmth is apt to produce symptoms of over-excitement, such as headache, restlessness, nervous irritability. Aged and very torpid individuals may, however, indulge in a bath which is two or three degrees warmer. In many cases it will be ad-

visible to use the precaution of applying a sponge or a napkin dipped in cold water to the forehead, to prevent symptoms of cerebral congestion. When used preparatively to bathing in the open air, the temperature of the warm-bath must be gradually diminished, so that when the first, for instance, has been taken at 89° , the second may be lowered to 86° , and the third to 83° or 82° . While in the bath, colder water may also be poured over the back.

The duration of the warm sea-bath varies according to the individual case. Where a resolvent effect is particularly required, as in scrofulous children with enlarged glands or in torpid constitutions, it may be prolonged to thirty or forty minutes. But this should be the extreme limit, except in very rare cases, for no good effect can be expected from a longer continuance in the bath, but rather over-excitement and consequent weakness.

For irritable constitutions, and where a strengthening effect is chiefly required, the bath must neither be of so high a temperature nor continued for so long a time. Twenty

to twenty-five minutes for adults; ten to fifteen for children, will be found quite sufficient to produce the desired effect.

Weak and irritable individuals, in whom the bath produces symptoms of excitement, such as an unquiet sleep or nervousness, ought only to bathe every other day, and must particularly avoid taking their bath too warm; and remaining too long in it.

Some individuals, whose skin is uncommonly irritable, are almost as little able to support warm as cold sea-bathing; in this case the salt water should be mixed with one-fourth or one-half fresh water, or emollient substances be added to it, such as starch, in the proportion of two pounds to the bath, or a decoction of four to six pounds of bran; or gelatina, in sufficient quantity to blunt the stimulus of the salt.

The best time for taking a warm-bath is about mid-day. On leaving it, one must rest for a quarter or half an hour, and then take some moderate exercise. The patient need not fear to catch cold so easily as after a common warm-bath; but his clothing must,

of course, be sufficiently warm to entertain the reaction of the skin.

If the weather is cold and rainy, it will be advisable not to bathe, unless where there is convenient room to take exercise under cover.

The use of the warm-bath requires the same precautions as that of the cold. All mental and bodily excitement must previously be avoided, and bathing on a full stomach would be equally injurious. The same care must be taken with regard to regimen; and as patients using the warm-bath are generally of a weaker constitution, or more advanced in years, all fatigue must be studiously avoided; while, at the same time, whenever the weather is favourable, the greater part of the day should be spent on the beach.

Patients using the warm-bath must particularly avoid keeping late hours and remaining out of doors after sunset.

The number of baths which is necessary for a cure varies according to the different cases. Scrofulous children, who spend the whole summer on the coast, may take as many

as forty or fifty, with proper intervals of rest. For the purpose of strengthening, twenty to twenty-four are generally sufficient : three to four are enough in most cases as a preparation for the cold-bath.

CHAPTER X.

THE DOUCHE BATH.

THE douche-bath consists, as is well-known, in a jet or column of water, striking certain parts of the body with more or less violence, according to the height from which it falls, or the strength with which it is impelled. It is either progressively directed against a greater surface of the body, or its action is confined to a small space, according to the more general or local effect which is required.

A strong douche-bath calls forth a very considerable reaction in the part on which it plays, and this is not confined to the skin, but extends to a greater depth beneath the surface. If the part was weakened or relaxed, its vitality is mightily roused by this powerful stimulus, the blood circulates more freely through its tissue, and an improved

nutrition is the result, through which at the same time the functions are restored to their healthy condition. Thus, in many cases of local debility and diseased vegetation,—such as indolent scrofulous tumours and exudations, obstinate swellings of the glands, arthritical concretions and contractions, atonic rheumatisms, weakness resulting from dislocation or a sprain, local nervous affections and paralysis, &c.,—the douche-bath is one of the most powerful remedies known. Cold douches on the head have already been recommended as far back as the first century of our era, by Celsus and Aretæus, against mental derangement, giddiness, weakness of the memory, and tendency to apoplexy.

The douche-bath is also an excellent remedy in many cases of general weakness. Scrofulous children, from three to twelve years old, shew a considerable improvement after having used it for two or three months, and its prolonged employment completely transforms their originally weak constitutions.

Young persons suffering from chlorosis, which had withstood the use of iron and

of all other pharmaceutical remedies, have frequently been radically cured by a five to six month's use of the douche-bath.

In cases of weakness from considerable losses of blood, and after prolonged and dangerous illnesses, the douche-bath, by rousing the energies of the nervous system and promoting circulation, increases the appetite and the powers of digestion, and thus paves the way for the improvement of the blood.

Thus its effects are analogous to those of sea-bathing, the shock of the waves being, in fact, an extensive douche-bath, which by striking a great part of the body at once, makes a powerful impression on the economy. The douche-bath may, therefore, in a great many cases, but more particularly in local affections, where a considerable partial stimulus is desirable, be very advantageously used, conjointly with sea-bathing, either employing it alternately every other day, or even daily; or as a substitute, when the weather is rainy and boisterous, or the surface of the sea unruffled with a wave. The salt-water douche-bath has a more powerful effect than

where fresh water only is used ; and on the coast its beneficial action finds a very important auxiliary in the pure and invigorating sea-air.

It is a far too powerful remedy to be used without advice, as it may be productive of very disastrous effects when wrongly employed ; its violence, duration, and temperature, must always be strictly regulated according to the reactive strength of the patient.

When too much prolonged, it produces a numbness and growing insensibility in the part, which may extend over the whole body, and cause a considerable general depression, frost, shivering, spasms, and fainting ; or else it provokes a violent reaction and symptoms of excitement, which are equally prejudicial. As soon, therefore, as the skin begins to red-den, and show signs of an increased sensibility, and a prickling sensation is felt in the parts beneath it, the stream must be immediately stopped. Even strong people cannot stand its long duration, and least of all on the head. The greater the violence of the shock, and the thickness of the stream, the

shorter of course must be the continuance of its action. The duration of the douche-bath for adults must generally not exceed fifteen minutes; for children, five to ten. It is used conjointly with cold and warm sea-baths; its temperature being analogous to that of the bath. Stimulation and expansion of the skin take place very soon, where the warm douche-bath is used; the reaction appears later when the stream is cold. Weak and delicate patients must begin with the warm, and finish their cure with the cold douche-bath.

When it is used for general weakness, it must be progressively extended over the whole body, but particularly directed along the spine. When a larger stream of water is made to fall perpendicularly upon the patient, he must hold his hands over his head, to protect it from the shock; so that the stream first of all strikes the neck and back, and then by degrees the whole body. Sensitive patients must previously rub their forehead, breast, and pit of the stomach with water. Dry friction in different parts

of the body will be found to facilitate reaction.

While the douche-bath is using, all changes of temperature, currents of air, and draughts, must be avoided.

Where it is intended to strike the arms, the lower extremities, or any swollen part, it must not be immediately directed upon it, but approach it by degrees, and play obliquely on its surface. This precaution must be particularly attended to where a joint is affected, for here the evil cannot be taken by storm, all that is required or tolerated, being a gentle excitement of the vitality of the part, in order to assist or provoke the healing efforts of nature.

After the douche-bath the patient must rest for some time, and refrain as much as possible from using the affected part. It must not be employed during digestion, or when the body is in a state of mental or physical excitement.

CHAPTER XI.

INTERNAL USE OF SEA-WATER.

THE waters of the ocean everywhere abound with salts, but their quantity is found to vary in different latitudes and seas. Thus, in the equatorial zone, the Atlantic contains more of them than in the Polar regions (as if Nature, by an admirable provision, had increased the proportion of salt where the waters are more liable to corruption); and while in the Mediterranean their quantity surpasses 4 per cent., it scarcely amounts to $3\frac{1}{2}$ along the British coast.

The principal salts found in sea-water are :

Muriate of soda (kitchen salt) about	2.50	per cent.
Muriate of magnesia "	0.30	"
Sulphate of magnesia "	0.30	"
Sulphate of lime "	0.15	"
Muriate of lime "	0.15	"
	<hr/>	
	3.40	"

besides traces of carbonate of lime, carbonate of magnesia, protocarbonate of iron, phosphate of lime, hydrobromate and hydriodate of magnesia, and a variety of other substances.

It contains also, particularly near the shore and at the surface, a slimy glutinous substance, produced by the innumerable tribes of plants and animals which inhabit the depths, or line the margin, of the ocean. To this substance Deslandes and Fourcroy attribute, in a great measure, its disagreeable taste.

Atmospheric air, which is as necessary to the existence of marine animals as to that of the inhabitants of the land, and carbonic acid gas, are likewise found mixed with sea-water. As the salts which it contains in such abundance have strong medical properties, it is fully entitled to rank as a powerful mineral water, and its internal use will be found advantageous in a great many cases.

In small doses—morning and evening a wine-glass—it stimulates the mucous membrane of the stomach and digestive tube, and calls forth an increased secretion of mucus.

Being introduced by absorption into the economy, it gradually diminishes the plasticity of the blood (salts having the property of dissolving albumen and fibrin), stimulates the lymphatic vessels and glands, and promotes the secretions of the liver, pancreas, and kidneys.

In consequence of these alterative, deobstruent, blood-cleansing, and blood-thinning effects, it proves a valuable remedy,—

1. In many cases of abdominal plethora or congestion, when the secretions are irregular and the blood is thickened; as also of hæmorrhoids, jaundice, dyspepsia, hypochondria, and melancholy proceeding from this cause.

2. In scrofula, particularly where the lymphatic glands of the mesentery and other vegetative organs of the abdomen are swollen and obstructed, and where digestion suffers in consequence of languid secretion.

It agrees best with torpid constitutions and a full habit of body, and would be very injurious in all cases where there is already a deficiency or a watery mixture of the blood, or a liability to passive hæmorrhages, or where

the system only requires to be strengthened, and does not stand in need of increased evacuations. Its prolonged use is apt to weaken the digestion, and ultimately to produce scorbutic symptoms. At all events, it ought not to be resorted to without proper advice.

In larger doses—two or three tumblers after short intervals—it acts as a cooling purgative, and brings forth a copious secretion along the whole intestinal canal, but without irritating the nerves or the blood-vessels, and without causing pain or heat.

It may consequently be used with advantage as an opening medicine, when constipation takes place during a course of sea-bathing, or where there is a tendency of blood to the head; but recourse must not be had to it where the digestive organs are weak, and in all cases where saline laxatives are counter-indicated.

For internal use, sea-water must be fetched at some distance from the strand, and at a depth of several feet, as it will then have a less disagreeable taste, which may also be im-

proved by adding it to milk, or mixing it with beef-tea. It may also be procured at a chemist's, filtered and saturated with carbonic acid. Children, in general, have no particular distaste for it, and soon learn to take it without compulsion.

In clysters it is a good remedy for ascarid-worms, with which children are frequently tormented. At first it should be mixed with one half fresh water, and the quantity of the latter gradually diminished, until it is employed pure.

When used for injections, or applications in scrofulous diseases of the eye, care must be taken that no sand be mixed with it.



CHAPTER XII.

THE LENGTH OF THE CURE, AND THE BEST SEASON FOR
BATHING IN DIFFERENT COMPLAINTS.—THE PROPER REGI-
MEN AFTER LEAVING THE COAST.

BEFORE answering the question how many baths the patient is to take, or how long he is to stay on the coast for the accomplishment of his cure, we will premise a few observations on the changes sea-bathing is expected to bring about in the disordered constitution.

In all cases for which it is an appropriate remedy, the energy of the nervous system is weakened, and at the same time, on account of the intimate connexion between solids and fluids, the composition of the blood is more or less deviating from the standard of health.

The diminished power of the nervous system can only be restored by the improvement

of its nutrition ; for healthy activity cannot possibly exist without a good physical constitution of the organ from which it proceeds ; and, again, nutrition can only be improved by means of a healthy, well-conditioned blood.

But sea-bathing, as we hope to have satisfactorily proved, leads to health, by acting at the same time on the solids and the fluids, by strengthening the nutrition of the former, and improving the composition of the latter. Now it is evident that changes such as these can only be gradual—the silent work of time ; and this alone would be sufficient to prove that it is impossible peremptorily to determine beforehand the number of baths which will be necessary for the desired effect.

The difficulty is still further increased, if we consider that bathing in calm weather, and when the water is warm, is not like bathing in the cold, and when the waves strike with full force against the body ; and that it must necessarily make a difference whether a serene sky favours exercise and the day-long enjoyment of the bracing sea-air, or rain keeps one a prisoner within doors. Besides, where

one patient favours his cure by a proper regimen, and takes care not to lose a single day, another, by continually committing faults in his diet, does all he can to counteract its progress.

The physician who sees the patient on the spot, and witnesses the advances he makes towards health, is, therefore, the only competent judge of the necessary duration of his cure. Beforehand the time only can be determined which will *probably* suffice for effecting it.

Thus, wherever a disease has struck deep roots, so as to have become habitual; where the constitution is very much weakened, and can evidently regain strength but very slowly; where great laxity of the fibres is joined with vitiated humours and weak reaction, as in scrofula; the patient will do well to remain during the whole summer on the coast; and, at all events, eight to ten weeks will be necessary to secure anything like a lasting effect. Frequently even, and particularly in cases of congenital debility, the cure must be repeated during several consecutive years.

Where the patient was originally strong, and his complaint has not yet, from long continuance, become, as it were, part of his constitution, where a more energetic reaction may be anticipated, a shorter time will be sufficient; but even here it will be better to make a liberal allowance, and to fix upon five or six weeks as a minimum.

In cases, finally, of smaller importance, such as simple irritability of the nerves, brought on by mental exertion, or an irregular way of living, three or four weeks spent on the coast will answer the desired effect and restore the tone of the constitution.

The proper season for bathing differs in different complaints. Where the nerves more particularly require to be strengthened, and the powers of reaction are not reduced to too low an ebb, a colder temperature of the bath, and the predominance of cooler sea-breezes, will be productive of greater benefit than if the patient chooses the warmer months of the year for his sojourn on the coast. In these cases, bathing may advantageously be begun as early as the month of

May, or else September and October will be found extremely salutary. As the shock of the waves is one of the most important strengthening influences which act upon the body in the bath, care must be taken to select a shore where the breakers are strong; and as a warm temperature is less bracing, those coasts are to be avoided where the climate is generally mild and soft.

In other cases, where the reactive powers of the patient are weak, and cold is not so well supported, as in elderly persons, delicate females and young children, in scrofula or rickets, where, playing and sitting for hours together on a beach warmed and enlivened by the sunbeam, is particularly beneficial; where a gradual improvement of the vegetation and nutrition of the solid parts is the principal aim in view; where the use of the warm sea-bath is preferable to that of the cold, the patient will derive greater advantage from the summer months and a milder climate.

Sometimes a fashionable well-attended bathing place will be the one best adapted to the

state of the patient ; in other cases, a quiet, secluded spot, where his over-excited nerves may repose in the calm of retirement, will be preferable. All these circumstances of time and place should be well weighed beforehand, as the success of the cure in some measure depends upon them.

The increased vital action which sea-bathing calls forth in our organs, does not cease immediately after leaving the coast, but continues for a long time after to effect beneficial changes in the nutrition of the solids and the composition of the blood. Hence many patients, who had left the bath without having, as they thought, derived any benefit from it, only begin to perceive its good effects after weeks or even months have elapsed, when the changes to which sea-bathing gave the impulse have been finally completed by the slow hand of time. After the last bath has been taken, the patient must therefore by no means fancy that his cure is at an end, as very often it is merely in the beginning of its progress ; and as his organization still remains for a longer or shorter period in a state of excite-

ment, he must continue to pay a more than ordinary attention to his regimen, lest he disturb the vital powers while they are more than commonly active in raising the standard of his health.

On this account it is very desirable that he should not at once plunge into the cares and fatigues of business after returning home, but rather devote a few weeks to tranquil repose, or at least only moderately task his mind; and, as much as possible, avoid every other kind of excitement, such as late hours, parties, &c.

By practising moderation in every respect, he is in the right way to reap as much benefit from his cure as can possibly be expected; by pursuing a contrary course, he completely endangers its success.

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